

**Assistance on Securities Settlement and
Clearance to The Stock Exchange,
Mumbai (BSE)**

**Financial Institutions Reform and
Expansion (FIRE) Project**

November 1997

**Financial Institutions Reform and Expansion
(FIRE) Project
US Agency for International Development
(USAID/India)
Contract #386-0531-C-00-5010-00
Project #386-0531-3-30069**

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November 25, 1997

Mr. M. G. Damani
President
The Stock Exchange, Mumbai
Phiroze Jeejeebhoy Towers
Dalal Street
Mumbai 400 025.

Dear Mr. Damani,

**Re: Assistance on Securities Settlement and Clearance to The Stock
Exchange, Mumbai (BSE)**

At your request and as a part of our contract with the USAID, Ms. Susan Hertel, Former Vice President with the Midwest Clearing Corporation/ Midwest Securities Trust Company of the US and consultant to Price Waterhouse Capital Markets (*PW*), has completed the next part of our activity towards assisting the Securities Settlement and Clearance process at the BSE.

Purpose of Activity

The purpose of this activity was to continue PW- FIRE assistance to the BSE in streamlining current operations while bringing international standards in trading, clearance and settlement to the Exchange.

Background

Price Waterhouse - FIRE (PW) project consulting team of Mr. Joe Schenk and Ms. Sue Hertel has been working with BSE throughout the year in various areas of trade settlement and securities clearance.

The following three-pronged scope of work was identified:

- Improvement of the cash settlement process at BSE as currently performed by Bank of India Shareholding.
- Streamlining of the overall securities clearing process.



- Conversion of certain scrips to a five-day rolling settlement cycle.

A project Committee was established to address the various areas to be reviewed. Guidance at these meetings was provided by Mr. Schenk with assistance from Ms. Hertel. The Committee reviewed each step of the trading, clearance and settlement processes for problems in both workflows and processing time. Some of the resulting potential solutions could be easily implemented while others needed further approval or other actions .

A separate deliverable was produced in September, 1997, under the title of "Mumbai Stock Exchange (BSE) -- Review of Cash Settlement Process and Proposed Related Securities Depository". The enclosed paper prepared by Ms. Hertel summarizes activities under the securities trading and settlement facets of the scope of work, with further comments on cash settlement as appropriate.

Recommendations

Recommendations by the project Committee primarily covered improvements to work flows at BISL in the processing of physical securities. Results of these recommendations include:

- The planned implementations of automated delivery information exchange to replace floppy diskettes.
- Development of a bar coding concept for packages of securities delivered to the clearing house.
- Earlier production of delivery orders and money statements that could ultimately support a one-day time savings in final clearance and settlement.

Other issues that were addressed included the following:

- Ensuring that cash settlement is done within a same-day funds environment.
- How delivery-vs.-payment (DVP) can be accomplished.
- Implementation of the use of ISIN security identifiers.
- How courier services can be improved in India.

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- Staffing and training needs of the clearing house (and as related to another BSE/PW project).
- Security for the physical facility of the clearing house.

As a result of all of these efforts, PW has recommended that BSE continue to focus on improving its clearing and settlement operations. BSE should focus on the continued development of their clearing house, making this one of the highest priorities within the Exchange. BSE has an opportunity to set the standard for clearing houses in India through developing efficient clearing and settlement operations that will eventually support DVP, and become an industry leader in several related areas as noted within this paper.

BSE should not hesitate to use its position in the community to demand improvements of services. By doing so, BSE will be viewed as a leader in developing processes critical to the Indian securities industry as a whole.

Next Steps

Ms. Susan Hertel shall return to India in January 1997, to continue her assistance towards streamlining the Settlement and Clearance Processes at the BSE. PW is prepared to consider further assistance as requested by BSE in those areas needing additional work..

For the success of this project the participation and cooperation of your management and staff is essential. We would like to thank you and your colleagues at the BSE for the time, courtesy and cooperation extended to us during the course of this project.

Please get in touch with us at the FIRE project for any clarifications you may require.

Thanking you,

Yours sincerely,

A handwritten signature in black ink, appearing to read 'W. Dennis Grubb' with a stylized flourish at the end.

W. Dennis Grubb
Principal Consultant

***Assistance on Securities Settlement and Clearance
to
The Stock Exchange, Mumbai (BSE)***

***Price Waterhouse LLP
Mumbai
November 1997***

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- B. The Clearance and Settlement Project Committee of the BSE**

I. EXECUTIVE SUMMARY

Price Waterhouse - FIRE (PW) project consulting team of Mr. Joe Schenk and Ms. Sue Hertel has been working with BSE throughout the year in various areas of trade settlement and securities clearance.

Based on a request for assistance from BSE in streamlining current operations while bringing international standards in trading and settlement to the Exchange as recommended by the "Group of 30" (A summary of these recommendations used as a point of reference, may be found in Appendix A.), the following three-pronged scope of work was identified:

- Improvement of the cash settlement process at BSE as currently performed by Bank of India Shareholding.
- Streamlining of the overall securities clearing process.
- Conversion of certain scrips to a five-day rolling settlement cycle.

The above work supported **BSE's** overall immediate corporate objectives and **PW's** requirement for a manageable project.

A project committee was established to address the various areas to be reviewed. Guidance at these meeting was provided by Mr. Schenk with assistance from Ms. Hertel. (Committee members provided by BSE may be found in Appendix B.)

Note: It should be noted that this combined project committee is separate from the Clearing House Coordination Committee previously set up by BSE to act as a liaison between BSE and the Bank of India (BOI). The liaison committee is a permanent advisory committee that reviews difficulties in processes that are encountered by the clearing house (BISL) which is a joint venture between BSE and BOI.

The project committee met twice weekly based on the availability of members, including the PW consultants. During the meetings each step of the trading, clearance and settlement processes were reviewed for problems in both workflows and processing time. Some of the resulting potential solutions could be easily implemented while others needed further approval or other actions . . .

During the project committee meetings, Mr. Schenk provided guidance on securities trading and settlement based on his extensive trading background. Ms. Hertel focused on the cash settlement process using her extensive experience with a U.S. depository in the area of cash management and daily cash settlement, but also participated in discussions on securities trading and settlement.

A separate deliverable was produced in September, 1997, under the title of "Bombay Stock Exchange (BSE) -- Review of Cash Settlement Process and Proposed Related Securities Depository". This paper as prepared by Ms. Hertel will summarize activities under the securities trading and settlement facets of the scope of work, with further comments on cash settlement as appropriate.

Recommendations by the project committee primarily covered improvements to work flows at BISL in the processing of physical securities. Results of these recommendations include:

- The planned implementations of automated delivery information exchange to replace floppy diskettes.
- Development of a bar coding concept for packages of securities delivered to the **clearing** house.
- Earlier production of delivery orders and money statements that could ultimately support a one-day time savings in final clearance and settlement.

Discussions held offline of the committee meetings addressed:

- Ensuring that cash settlement is done within a same-day funds environment.
- How delivery-vs.-payment (DVP) can be accomplished.
- Implementation of the use of **ISIN** security identifiers.
- How courier services can be improved in India.
- Staffing and training needs of the clearing house (and as related to another **BSE/PW** project).
- Security for the physical facility of the clearing house.

The importance of moving to S-day rolling settlement was also discussed by the project committee and segments of trading were considered for possible implementation of such a system. With the development of the Sunshine Segment by BSE senior management, further work in this area was postponed until the activity within the Sunshine Segment could be studied.

BSE has also contracted its software vendor, CMC, to review all BSE computer systems. Recommendations by the **PW/BSE** project committee will compliment the current work being done by **BSE's** software vendor, CMC. The objectives of **CMC's** work are to improve and increase automation at BSE, make the various systems interactive, and move all systems

to one computer platform. The accepted recommendations of the **PW/BSE** project committee will be implemented along with other changes by CMC as appropriate.

As a result of all of these efforts, PW has recommended that BSE continue to focus on improving its clearing and settlement operations. Further, BSE should become proactive in such related areas as working with the banking industry to establish electronic funds transfer and strengthen banking law on the finality of payment in India to support cash settlement, and working with courier services to provide India with a safe, efficient method to transport securities within the country. Other areas where BSE can take this position will continue to be defined, and BSE should not hesitate to use its position in the community to demand improvements of services. By doing so, BSE will be viewed as a leader in developing processes critical to the Indian securities industry as a whole.

II. BACKGROUND

Price Waterhouse - FIRE (PW) project has been working with BSE throughout the year in various areas of trade settlement and securities clearance. This work was initiated by a request for assistance from BSE in several related areas. The objective of the assistance was to guide BSE in streamlining current operations while bringing international standards in trading and settlement to the Exchange as recommended by the "Group of 30". (A summary of these recommendations may be found in Appendix A as a point of reference for this paper.)

Based on the work that needed to be done, PW and BSE agreed to the following **three-**pronged scope of work:

- **Improvement** of the cash settlement process at BSE as currently performed by Bank of India Shareholding.
- Streamlining of the overall securities clearing process.
- Conversion of certain scrips to a five-day rolling settlement cycle.

The above work supported **BSE's** overall immediate corporate objectives. The scope outlined also met **PW's** requirement for a manageable project.

Two consultants were assigned to this project by PW. Mr. Joe Schenk provided guidance on securities trading and settlement based on his extensive trading background. Ms. Sue Hertel focused on the cash settlement process using her extensive experience with a U.S. depository in the area of cash management and daily cash settlement, but also participated in discussions on securities trading and settlement.

A separate deliverable was produced in September, 1997, under the title of "Bombay Stock Exchange (BSE) -- Review of Cash Settlement Process and Proposed Related Securities Depository". While that report focused on the cash settlement process, this paper as prepared by Ms. Hertel will summarize activities under the securities trading and settlement facets of the scope of work. Comments on the cash settlement report are also incorporated here as appropriate.

It should also be noted **that BSE** has contracted their software systems vendor, CMC, to review the various systems used by the Exchange and the clearing house.

Note: *CMC has previously designed various BSE computer systems.*

The objectives of the CMC review are:

- ▶ Improve automation where functions are already done by a computer system.
- ▶ Increase automation where functions are currently performed manually.
- ▶ Make the various independent systems interactive.
- ▶ Move all systems to one computer platform.

The work done by the **PW/BSE** project committee will compliment the CMC objectives. Comments to this effect are included as appropriate within this paper.

III. APPROACH TO REVIEW

To address the various areas to be reviewed, a project committee was established. Guidance at these meetings was provided by Mr. Joe Schenk with assistance from Ms. Hertel. Committee members provided by BSE may be found in Appendix B.

Note: This committee is separate from a liaison committee (known as the Clearing House Coordination Committee) previously set up by BSE to address issues between BSE and the Bank of India (BOI). The liaison committee is a permanent advisory committee that reviews difficulties in processes that are encountered by the clearing house (BISL) which is a joint venture between BSE and BOL. This function differs from the purpose of the committee established for the project with PW. Changes that have resulted from work with the advisory committee are not addressed within this paper.

The project committee met twice weekly based on the availability of members, including the PW consultants. Each step of the trading, clearance and settlement processes were reviewed during the meetings. Problems were identified in both **workflows** and processing time. Potential solutions were then developed. Some of those solutions were easily implemented while others needed to be delayed for further approval and/or because the solution was dependent on another action.

As a supplement to the project committee meetings, discussions were also held with Kalpana **Maniar** of BSE and C. D. Khambatta of BISL. These discussions addressed additional issues not covered in committee meetings, but would compliment recommendations made by the project committee.

The following sections of this deliverable are intended to document the identified problems, proposed solutions, the implementation of those solutions to date, and further recommendations resulting from both project committee meetings and offline discussions.

IV. SECURITIES CLEARANCE AND SETTLEMENT - CHANGES RECOMMENDED AND/OR IMPLEMENTED

The project committee focused on the current trading cycle vs. moving toward a **5-day** rolling settlement and the steps required **from** trade date to the final delivery of securities. While the committee was not empowered to change the trading cycle, such a change had to be considered to ensure that:

- BSE understood the importance of moving to **5-day** rolling settlement to bring the Exchange up to international (and G-30) standards.
- Recommendations and actions in the area of streamlining the clearing house also accommodated this possibility.

These needs were further supported by the implementation of the “Sunshine Segment” (which follows a **5-day** rolling settlement cycle) by BSE as discussed further below.

In the area of clearance and settlement, the committee identified the following problem areas to be addressed:

- Length of time **from** trade date to the delivery of securities and final settlement of trades.
- The exchange of settlement data between BISL and its members on floppy diskettes.
- The labor-intensive processing of physical securities by the clearing house.
- Auction positions

The following narrative discusses the Sunshine Segment as well as the above areas where there is a desire to streamline and/or update processes.

a. Sunshine Segment

During the initial stages of the project committee activity, there were preliminary discussions on how BSE could begin moving to **5-day** rolling trade settlement. Certain segments of trading were identified by ~~the~~ project committee as potential targets for this change. It was believed that by limiting the exposure to a certain segment of trading settlement, BSE members would have the opportunity to understand and adapt gradually to a new trading environment. Initially, members of the project committee believed that “A” scrips could be the first trading segment to be converted to rolling settlement.

As of September 1, 1997, BSE management (independent of the project committee) has

introduced **5-day** rolling settlement in the “Sunshine Segment”. This trading segment encompasses all BSE-listed securities but is limited to only those securities that are registered in the names of institutional investors. All BSE members may participate in this trading segment.

BSE trading systems have been enhanced to accommodate this process. Pay-in/pay-out days coincide with standard **5-day** rolling settlement cycles. Adjustments to auction dates, objection processing, and margin requirements have also been made for the “Sunshine Segment”.

Theoretically, securities involved in the “Sunshine Segment” should be generally **free** of the risk of bad deliveries because of the required registration in the names of institutional investors. Therefore, it was believed that by limiting the involvement in rolling settlement to such securities would increase confidence in the trading system.

Trading in the “Sunshine Segment” is still at a low volume. It is believed by BSE and BISL representatives on the project committee that the concept of rolling settlement has not caught on primarily because the custodians need to improve and market their ability to service this type of settlement. Custodians have not been proactive in this area because of their current methods of safekeeping securities. Certificates are not maintained in vaults by registration, but by security. Therefore, what is perceived to be “good” paper because of the registration in the name of institutions is co-mingled with all other certificates. Custodians have to sort through all certificates to **find** the deliverable items for the “Sunshine Segment”. Under this current method of processing, custodians could not service high volumes.

BSE remains committed to the “Sunshine Segment”. The management continues to **monitor** the development (if any) of this new trading environment. However, the position at BSE appears to remain at the “wait and see” stage. BSE management needs to take a more active roll in working with all parties involved to develop confidence in this program. The Exchange needs to show support to users of the system by providing guidance on how procedures need to be changed and marketed.

The Exchange may also want to re-evaluate which scrips are eligible for **5-day** rolling settlement. There may be a different trading segment that is more likely to be accepted by members and investors.

Whatever approach is eventually decided upon, the Exchange must continue to pursue conversion to **5-day** rolling settlement to meet international standards. The difficulties encountered in changing the trading process should not be viewed as reasons to abandon the conversion. Rather, BSE should focus on educating and supporting members and other industry participants in moving to **5-day** rolling settlement.

b. Timing of Clearance and Settlement Processing

The project committee spent an extensive amount of time in reviewing the timing of securities clearance and settlement. There were several areas where it was believed that time deadlines for the clearing members could be moved, thereby shortening the time from the last trade date of the trading period to the delivery and payment of securities (ultimately reducing the period of risk). Each recommended time savings would be dependent on the others. Specifically, the time savings developed in theory as related to the initial clearance and settlement process and the status of each action are as follows:

- Move the BADLA session to Friday night instead of Saturday. This has been removed as a possibility due to a recent study that included a consideration of the “breakdown” requirement. It was believed at the time that the project committee was reviewing the steps of clearance and settlement that the breakdown by brokers of deliveries vs. carry forward trading positions might be eliminated. The time allotted for this process would, therefore, be eliminated and the BADLA session could be held earlier. However, a decision has since been made that brokers must continue to break down their positions.
- Move the production of delivery orders and money statements to Saturday **from** Monday. This recommendation has been put into place.
- Move the pay in of shares to Wednesday through **11:00** A.M. on Thursday from Thursday and Friday respectively. This recommendation has not been implemented, but is still possible to do.
- Cash payment by brokers would be made on Thursday. This is also possible to do, but the full benefit of such a change would only be realized if securities could also be paid out on Thursday. The high volumes related to the physical processing of the deliveries at BISL prohibits this from happening. (See “Manual Processing of Securities” below).
- Based on the above changes, pay out of money and shares could be done on Friday instead of the next Monday.

Even without changing the timing of BADLA, implementation of the remainder of the above recommendations would result in a net time savings for clearance and settlement of securities of one business day. This would reduce the time from trade day to final settlement, and therefore risk, by that one day. Other timing changes under the auction and objection processes were also considered that would result in a savings of up to three business days.

BSE and BISL should continue to pursue whatever time savings can be made in the clearance and settlement process. No matter how small a reduction in processing time may seem, risk

is reduced and brings the settlement environment closer to DVP.

c. Transference of Data by Diskette

Members of BISL currently communicate settlement data to the clearing house on floppy diskettes. The information on the diskettes report what deliveries the brokers intended to **make on** settlement date as well as “shortages” or the securities that the brokers anticipate will not be delivered.

Diskettes were are delivered to BISL by **BSE’s** systems area (ISD). These diskettes carry the settlement data as developed **from** trading activity. BISL then loads these diskettes and the diskettes from members into a match system where exception reports are created.

Both PW and BISL’s management strongly felt that the manual intervention required under the creation, delivery, and comparison of the diskettes needed to be eliminated. It was believed that this process should be accomplished through transmissions between BISL and the members.

The above change is now in the process of being developed and implemented. Not only will this eliminated the manual steps done at BISL, but data entry at member offices will be significantly reduced. Members will only need to enter data once to internal systems that can then be downloaded to BISL for reporting and comparison purposes. Data will be validated at time of entry, eliminating the need for the production of exception reports and the research of exception items.

It is estimated by BISL that the time saved at the clearing house alone will be approximately 108 man hours per trading cycle. Members will realize similar time-savings. Of course, the additional benefit of this change is the reduction of errors and omissions that can occur under multiple inputs and the creation/handling of the diskettes.

d. Manual Processing of Physical Securities

The receipt of securities by BISL from the delivering brokers is currently manually intensive. Included with the securities pouches are the delivery details (known as the “1 1/12 forms”), a summary list of deliveries as prepared by the brokers, and the Delivery Orders as previously produced by ISD and given to the brokers.

The **BISL** staff must manually check to ensure that the 1 1/12 forms agree with the **broker-**prepared summary lists. Once this is determined, the deliveries are manually entered to BISL’s automated matching system, confirming receipt.

BISL management believes that this manually-intensive process can be relieved through a bar coding system. Under such a system, the delivery member would affix a bar code to each

securities pouch. This bar code would be scanned by BISL, identifying to the clearing house system what deliveries have been made.

PW supports the consideration of this concept and encourages BISL to continue to move toward adopting this or any other method of automation that will minimize the manually processing of deliveries. It is noted that BISL has already begun work with the systems **consultant**, CMC, to consider the feasibility and implementation of this change.

e. Auction Positions

The existence of auction positions increases risk in trade clearance and settlement by extending the time **from** the original trade to delivery against the auction trade in clearance of shortages. ,

One method to minimize shortage positions is the development of a securities lending program. SEBI has recently approved such a program, and some financial institutions are considering implementing this service. BISL plans to apply to SEBI for approval to become a lending intermediary. The stock loan program will be built into the existing system at BISL. Regulations and procedures that will apply to the stock loan program are currently being evaluated by BSE and BISL.

A more immediate way to minimize these shortages is to require that investors deliver securities to their brokers prior to initiating a sale trade. This recommendation has been made by Mr. Joe Schenk of PW based on his experience with a large brokerage firm in the U.S. and the use of this policy at that firm. Certainly, this approach is especially useful in ensuring that securities sold are available for delivery on settlement date where the broker is not confident that the seller can/will deliver the securities on a timely basis.

The requirement of securities delivered to the broker prior to initiating a "sell" trade does not have to be a regulatory issue, but can simply be policy as established at brokerage firms. BSE may want to consider encouraging their members to take the position that securities must be delivered to the broker's office prior to effecting a sale.

However, it is also realized that this arrangement would be extremely difficult in the Indian environment due to investor attitudes and, of course, the lack of an efficient courier system. The idea is simply offered here as an alternative that may be used if not now then for the **future**.

V. CASH SETTLEMENT - RECOMMENDATIONS/COMMENTS

a. Previous Deliverable on Cash Settlement

During discussions on securities clearance and settlement held by Ms. Hertel with Ms. Maniar and Mr. Khambatta, the previous paper on cash settlement was also reviewed. In the separate deliverable on cash settlement, PW made the following recommendations:

- Full automation of the Processing of cash debits and credits to members using file transmissions **from** BSE to BOI.

Note: In addition to debits and credits related to the delivery and payment of securities, this recommendation included other monies due to/from members. These amounts included general billing, penalties, auction commission, margin, etc.

- Netting of all cash debits and credits due from and to members for trade settlement as well as other categories of cash activities in members' accounts.
- Work with the banking industry in the following areas critical to the cash settlement process:
 - ▶ Securing bank agreements with clearing members to facilitate the automation of the processing of settlement debits.
 - ▶ Development of electronic funds transfer between banks.

BISL has continued to work on implementing automating the various types of cash debits and credits against member bank accounts at BOI. Bank agreements with clearing members (as noted in the third point) are now being negotiated to support this work (approximately 50% completed as of October 15, 1997).

Netting of all cash debits and credits has not yet been implemented. SEBI has had a regulatory provision that requires that brokers maintain two bank accounts, actually segregating client funds from proprietary funds. However, this is not a fool proof system as funds can easily be transferred between bank accounts by brokers. The actual control should be within the books and records of the brokers, not by maintaining separate bank accounts..

BSE has recently addressed the separate bank account issue with SEBI. It is believed that this impediment to netting will now be removed. This change by SEBI will facilitate the netting of settlement debits and credits in the future.

Working with the banking industry in developing electronic funds transfer between banks

throughout India is still an open issue at BSE. Such a system would increase efficiencies in the payment system, further reduce risk by strengthening finality of payment, and reduce cash "float" in the Indian banking industry.

Note: *It should be noted that the requirement that clearing members bank at BOI automatically creates finality of payment and avoids float. (See also "Same Day Funds" below.) However, a wire (or electronic) funds transfer system would improve cash flow and payment capabilities for members, especially those outside of Bombay.*

It was also learned through discussion of the cash settlement deliverable that BSE does not have a credit line to provide temporary financing in the event that a member is late in meeting its cash settlement obligation. BSE does maintain a broker contingency fund for such temporary funding purposes. The Exchange also has a guarantee for in the event of a true broker default. The Exchange may also want to consider establishing a credit line to increase its options for temporary financing. The security for such a credit line would be the unpaid for securities credited to the defaulting members clearing account.

b. Same Day Funds

Prior to the implementation of automation of certain debits and credits by BISL, checks in payment of each debit were delivered by members to the clearing house on Thursday evening for the related trade settlement period. While some of the debit processing will be automated, checks will still be received for certain types of payments owed to BSE. BISL forwards these checks as received from members to the bank for deposit on the following Friday morning.

Where the check payment method is used, BOI notifies the Clearing House of any unpaid items on Friday, the day of deposit, by 6:30 P.M. Unpaid debits resulting from the automated entry procedure should follow this same reporting process.

Payments by members are considered to be final once the above report from the bank is received. There is no known possibility for payment reversals after the bank confirmation. Funds received against the debits are considered to be "good" funds with no float attached. While there is no written agreement in place with the settlement bank, BISL believes that Indian banking law provides for this finality of payment.

Assuming that the above is true, then cash settlement at BISL meets the test for same day funds settlement. Under this test, funds received must be irrevocable, final, and have no float attached. As long as these conditions continue on whatever day cash settlement occurs, then the same day funds requirement of G-30 has been achieved.

BSE and BISL should have the related banking law reviewed to ensure that there is no way for the bank to reverse its decision to pay a debit. Even if appropriate laws are in place, the

position of the clearing house could be strengthened through a written agreement between the bank and **BISL/BSE** on the finality of payment. If the laws are weak in this area, then such a written agreement is definitely needed as well some banking reform to meet international standards. (This is another area where BSE can be an industry leader if necessary.)

The bigger issue then is delivery versus payment (DVP).

c. ***Delivery vs. Payment (DVP)***

BSE recognizes that they need to move toward a DVP system. This will enable BSE to achieve another of the G-30 recommendations for international standards.

A DVP system minimizes the risk associated with the clearance and settlement by ensuring payment is made at the same time that physical delivery of securities occurs. The risk related to a non-DVP system includes payment failure by the receiving party and securities price fluctuations.

Interpretations of this G-30 recommendation allow for achieving DVP under several methods that include conditions such as:

- ▶ A central securities depository **with** a combined clearance and depository function linked to a **final** payment system.
- ▶ Securities delivery linked to a payments system that allows for simultaneous payment.
- ▶ Financial guarantees by a bank, clearing house/corporation, and/or securities' depository for the cash portion of settlement.
- ▶ Net settlement of cash and securities by the end of the day.

Whatever method is used, DVP requires the simultaneous payment of securities at the time of delivery, and that payment must be in final, irrevocable, "good" funds. While BSE can achieve this payment type through their clearing house (see "Same Day Funds" above), the simultaneous payment and delivery of securities still needs to be accomplished.

Currently, DVP through BISL is prohibited due to the excessively high volume of physical securities processed by the clearing house. Part time help is even used to turn the deliveries around as quickly as possible, but this still can't be completed all in one day. This situation needs to be addressed-by BSE and BISL so that DVP can be accomplished.

BSE must focus on how to meet this objective under their current settlement cycles (both weekly and rolling settlement in the Sunshine segment)so that "pay in" and "pay out"**must** occur at the clearing house on the same day.

VI. FURTHER RECOMMENDATIONS

While the project committee focused on the areas noted above, other issues related to BSE's original request for assistance were discussed off-line of the committee meetings. Comments and recommendations on these issues follow.

a **ISIN**

In their original letter to the FIRE project, BSE included a request for assistance from PW in developing their **ISIN** program. This is another international standard that BSE needs to meet.

SEBI currently assigns the **ISIN** number. The task for organizations such as BSE, the clearing house, and their respective members is to add this security identifier to their systems in a manner that will be useful in trading and the processing of securities.

There has been considerable resistance by the members to use **ISIN** because of the need to enhance all computer programs related to trading and clearance and settlement. It is believed by BSE that implementing this change would benefit from an action by SEBI to mandate the use of **ISIN**. However, BSE also recognizes that, if a way to easily introduce **ISIN** can be developed, this mandate is not necessary.

During a separate discussion held by Ms. Hertel with Ms. Maniar and Mr. Khambatta, it was realized that a solution to this problem may not be as difficult as originally thought. A relational database could be used through which the various types of input are processed. The current security identifier on all input would be checked against this database and converted to **ISIN** as needed. The **ISIN** would then be automatically filled into the appropriate field on system files, screens, and reports.

Ideas in this area include the ability for BSE members to be able to access BSE systems to obtain **ISIN** numbers for securities to facilitate all types of processes. The information could be provided in the form of "drop down" lists. This format would allow members to request **ISIN** information by entering only the first part of the **ISIN**. (This is known due to the specific format of the **ISIN**.) The system would display all **ISIN**'s beginning with the alpha/numeric combination requested. Members would then select from descriptive information a more specific security range to determine the actual **ISIN** needed.

This approach should be considered in the work being done by CMC to improve BSE's overall computer systems, and is specifically related to automating additional functions as needed and wherever possible.

b. Courier Services in India

One of the biggest problems in effecting timely settlements in India (and impacting the number of shortages that go to auction) is the inability to move securities quickly, efficiently, and safely throughout the country. Among investors, there is a general lack of trust in the postal system as well as private couriers due to a high level of thefts in the past. From the carriers perspective, there is a resistance to accepting the responsibility for the transportation of securities.

From an international perspective, it is inconceivable that this problem exists. Safe, economical courier systems are an absolute necessity for all operations within the securities industry. In the U.S., for example, there are several couriers that service this industry in an extremely **efficient** manner. Contracts are negotiated that reduce costs based on high volume usage. Computer terminals are provided by couriers that allow for the tracking of packages by the users. Insurance programs have been developed by both the couriers and the users to cover losses and thefts. Most importantly, couriers are held accountable for their breaks in service levels.

Most if not all of these same courier services are already available in India. It should be only a matter of pressure from the Indian securities community to secure the same level of service from these couriers as is provided in other countries.

This need was also discussed by Ms. Hertel with Ms. Maniar and Mr. Khambatta. It is highly recommended that BSE should become a leader in this area. The safe and timely delivery of securities is in the direct interest of the Exchange and its protection of its members. Therefore, BSE needs to be proactive in working with the facilities available to establish such a system nationwide.

c. Staffing/Training

As BSE continues to streamline and change processes, the impact on staffing also needs to be reviewed. Some areas may need less employees, while other areas will need more. Transferring and rotation of employees may be required to ensure efficient operations. Training needs will also change and increase.

BSE's Human Resources Department (HRD) should be kept well informed on operational changes that impact the number of employees and training. HRD can help the departmental management in addressing these areas as well as developing programs to help the staff adapt to their changing environment.

PW is also working with BSE's HRD in developing their ongoing internal training plans. Under this project, PW will make recommendations on department-specific training needs for selected areas of BSE. It is planned that the clearing house operations will be included as one

of these selected areas.

d. Facility Security

While streamlining the operations of the clearing house is extremely important, the improvements must be complimented with a physical facility that is secure. BISL has taken **steps** to improve physical security in the following ways:

- Only certain individuals are allowed into the clearing house in general. Authorized signatures are on file and are checked before allowing entrance to the clearing house.
- ▶ Access is further restricted in areas where securities are processed. Another authorization check is performed before allowing entry into such areas.
- ▶ Security cameras have been installed.
- ▶ There are plans to automate the authorization process through the use of computer read access cards.

BISL continues to monitor and improve facility security.

e. Depository Processing

Concurrent to work on streamlining clearance and settlement processes, BSE has been considering the development of their own securities depository. PW has provided limited assistance to the BSE staff in how to create the concept paper for this project. However, it is the belief of PW that BSE can better serve their members and the securities industry in general by continuing to improve its clearing operations, moving forward on becoming a member of the established depository, and acting as an industry leader in other areas that are critical to efficient trade settlement.

f. Regulatory Issues

Regulations governing the clearance and settlement of trades were not consulted by the project committee. However, it is recognized that some of the recommended changes might require regulatory updates or at least approval of **BSE's** proposed action(s). It is recommended, therefore, that BSE consult with its legal **staff** to review the respective regulatory areas prior to implementing any changes as recommended within this paper.

VII. SUMMARY AND NEXT STEPS

The combined project committee of BSE and PW participants have considered certain objectives of the Exchange to meet international standards in the area of clearance and settlement. These objectives also address the G-30 recommendations for clearance and settlement worldwide. Further, the objectives were the basis for the scope of work developed for PW assistance on this project on improvement of cash settlement, streamlining the securities clearance and settlement process, and rolling settlement. Specific issues dealt with by the project committee included:

- ▶ 5-day rolling **settlement/BSE's** Sunshine Segment.
- ▶ Timing of clearance and settlement processing.
- ▶ **Transference** of settlement data by diskettes between BISL and clearing members.
- ▶ Current manually-intensive processing of physical securities by the clearing house.
- ▶ Impact of the auction process.

Other discussions have been held off-line of the committee meetings between PW and BSE representatives (including BISL and BOI) that addressed separate topics related to improving the clearance and settlement process. These topics included:

- ▶ The previous deliverable by PW on the cash settlement portion of clearance and settlement transactions.
- ▶ Use of same-day funds for cash settlement.
- ▶ Delivery vs. Payment (DVP).
- ▶ Use of **ISIN** for security identification within all BSE systems.
- ▶ The need for improved courier services in India.
- ▶ Staffing within the clearing house and training of same.
- ▶ Physical security needs of the clearing house.
- ▶ **BSE's** proposed development of a depository.
- ▶ Potential regulatory issues.

Recommendations on improvements have been developed from all of the discussions on the above issues. These are summarized along with the status of each as follows:

RECOMMENDATION

STATUS

Move to 5-day rolling settlement with

Sunshine Segment active, but low volume.

BSE to work with members and custodians to improve participation in Sunshine Segment through support in procedural changes

To be considered by BSE.

Move BADLA session to Friday session.

On hold due to breakdown

Move production of delivery orders and money statements to Saturday.

In place.

Pay in of shares moved to Wednesday and Thursday (through **11:00**) a.m.

Possible but pending approval.

Cash payments by brokers on Thursday.

Possible but pending approval.

Pay out of money and shares on Friday instead of Monday.

Possible but pending approval.

Replace information exchange on diskettes with downloads from/to brokers.

Being developed.

Bar coding of security packages by brokers.

Pending review and approval.
May be included in work being done by CMC.

Implementation of stock lending program by BSE.

Regulations and procedures being evaluated by BSE and BISL.

Automation of cash debits and credits.

Gradually implementing.

Bank agreements with members to facilitate automatic debits and credits. ..

In place.

Netting of cash debits and credits.

Addressed with SEBI. Now possible.

Work with banking industry on EFT.

To be considered by BSE.

Establishment of a credit line to increase options for temporary financing of unpaid settlement debits.	To be considered by BSE.
Review banking law to ensure finality of payment does exist. Negotiate agreement with bank if necessary to ensure finality of payment.	To be considered by BSE.
Move toward DVP.	Pending. Currently prohibited by excessively high volume of physical securities processed by BISL. Identification of a solution needs to be set as a high priority.
Develop ISIN relational database and assist members implementing.	To be considered in work by CMC
Work with courier services to develop a process for safe and timely delivery of securities within India.	To be considered by BSE.
Develop specific training for clearing house staff.	To be included in work being done by PW and BSE's Human Resources Department.
Check regulatory issues before implementing recommended changes.	ongoing
It is the belief of the Price-Waterhouse FIRE project that BSE should focus on the continued development of their clearing house, making this one of the highest priorities within the Exchange. BSE has an opportunity to set the standard for clearing houses in India through developing efficient clearing and settlement operations that will eventually support DVP, and become an industry leader in several related areas as noted within this paper. PW is prepared to consider further assistance as requested by BSE in those areas needing additional work.	

APPENDICES

A. Summary of “Group of 30” Recommendations

B. The Clearance and Settlement Project Committee of the BSE

APPENDIX A - SUMMARY OF GROUP OF 30 RECOMMENDATIONS

(As printed in *Securities Operations - Second Edition*, Michael T. Reddy, New York Institute of Finance)

1. The industry will aim to have, by 1990, all comparisons of trades between direct market participants (i.e., brokers, broker/dealers and other exchange members) accomplished by T+ 1.
2. The industry will attempt to have indirect market participants (such as institutional investors, or any trading counter parties which are not broker/dealers) be members of a trade comparison system which achieves positive **affirmation** of trade details by 1992.
3. **By 1992** most countries will have an effective and fully developed central securities depository, organized and managed to encourage the broadest possible industry participation.
4. In environments where it is currently not the practice, delivery versus payment @VP) will be employed as the method for settling all securities transactions between direct and indirect market participants by 1992.
5. A "Rolling Settlement" system will be adopted by all markets. Final settlement will occur on **T+3** by 1992.
6. All securities settlement systems will move to a "Same Day Funds" environment, with payment for securities transactions among financial firms processed in an immediately available form by 1992.
7. Countries with sophisticated markets will adopt the standard for securities messages developed by the International Organization for Standardization (ISO Standard 7775) and will adopt the **ISIN** numbering system for securities issues as defined in the ISO Standard 6166, at least for cross-border transactions. These standards should be operational by 1992.
8. Clearing corporations and depositories in each market will establish information sharing programs for cross-market credit standards and monitoring systems for participants who deal in multiple markets.

APPENDIX B

THE CLEARANCE AND SETTLEMENT PROJECT COMMITTEE OF THE BSE

MEMBERS

V. V. Raut, General Manager, Market Operations

Kalpana Maniar, Executive Assistant to E.D.

P. P. Kaladharan, Dy. Gen. Manager, Settlement Systems (ISD)

C.D. ~~K~~**hambhatta**, Manager, Settlement Process, Clearing House

Alok Churiwala, Member, BSE